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2014

Test 2096: Case IH Steiger 540

Nebraska Tractor Test Laboratory

University of Nebraska-Lincoln, tractortestlab@unl.edu

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NEBRASKA OECD TRACTOR TEST 2096 - SUMMARY 961

CASE IH STEIGER 540 DIESEL

16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption Gal/hr (l/h)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1160 rpm)						
477.75 (356.26)	2101	26.61 (100.74)	0.391 (0.238)	17.95 (3.54)	2.37 (8.97)	
Maximum Power (1 hour)						
539.81 (402.54)	1902	28.23 (106.84)	0.367 (0.223)	19.13 (3.77)	2.72 (10.29)	
Standard Power Take-off Speed (1000 rpm)						
535.05 (398.99)	1811	27.66 (104.69)	0.363 (0.221)	19.35 (3.81)	2.53 (9.56)	

VARYING POWER AND FUEL CONSUMPTION

477.75 (356.26)	2101	26.61 (100.74)	0.391 (0.238)	17.95 (3.54)	2.10 (8.97)	Air temperature
414.64 (309.20)	2146	23.95 (90.67)	0.406 (0.247)	17.31 (3.41)	1.97 (7.46)	73°F (23°C)
312.88 (233.32)	2158	19.08 (72.21)	0.428 (0.260)	16.40 (3.23)	1.53 (5.79)	Relative humidity
209.50 (156.22)	2167	14.32 (54.19)	0.480 (0.292)	14.63 (2.88)	1.11 (4.20)	44%
105.39 (78.59)	2177	9.75 (36.91)	0.650 (0.395)	10.81 (2.13)	0.65 (2.44)	Barometer
2.71 (2.02)	2186	5.48 (20.75)	14.219 (8.649)	0.49 (0.10)	0.24 (0.89)	29.04" Hg (98.34 kPa)

Maximum torque - 1771 lb.-ft. (2402 Nm) at 1400 rpm

Maximum torque rise - 48.3%

Torque rise at 1680 engine rpm - 38%

Power increase at 1902 engine rpm - 13.0%

DRAWBAR PERFORMANCE

FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—5th Gear										
441.44 (329.18)	30445 (135.43)	5.44 (8.75)	2100	2.9	0.423 (0.257)	16.59 (3.27)	0.046 (0.028)	200 (93)	69 (20)	28.86 (97.73)
75% of Pull at Maximum Power—5th Gear										
341.84 (254.91)	22818 (101.50)	5.62 (9.04)	2152	2.1	0.444 (0.270)	15.82 (3.12)	0.042 (0.026)	201 (94)	73 (23)	28.82 (97.60)
50% of Pull at Maximum Power—5th Gear										
230.64 (171.99)	15197 (67.60)	5.69 (9.16)	2163	1.4	0.493 (0.300)	14.24 (2.81)	0.043 (0.026)	193 (89)	74 (23)	28.82 (97.60)
75% of Pull at Reduced Engine Speed—9th Gear										
341.84 (254.91)	22737 (101.14)	5.64 (9.08)	1484	2.2	0.383 (0.233)	18.36 (3.62)	0.038 (0.023)	198 (92)	73 (23)	28.82 (97.60)
50% of Pull at Reduced Engine Speed—9th Gear										
230.46 (171.85)	15201 (67.62)	5.69 (9.15)	1485	1.4	0.406 (0.247)	17.28 (3.40)	0.040 (0.024)	183 (84)	74 (23)	28.82 (97.60)

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: September 22-29, 2014

Manufacturer: CNH Industrial America LLC, 700 State St. Racine, Wi. 53404 USA

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8434 **Fuel weight** 7.022 lbs/gal (0.842 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 10W40 API service classification** CJ-4 **Transmission lubricant** Akcelia Hy-Tran Ultraction fluid **Hydraulic and axle lubricant** Akcelia Hy-Tran Ultraction fluid **Total time engine was operated:** 15.0 hours

ENGINE: Make FPT Industrial Diesel **Type** six cylinder vertical with two turbochargers, two air to water intercoolers and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** 000006114 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.315" x 5.906" (135.0 mm x 150.0 mm) **Compression ratio** 15.3 to 1 **Displacement** 786 cu in (12880 ml) **Starting system** 24 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, separate radiators for hydraulic and transmission oil **Fuel filter** two paper elements **Fuel cooler** radiator for pump return fuel **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) with a vertical muffler **Cooling medium** temperature control thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 180.1 - 191.1 lb/h (81.7 - 86.7 kg/h) **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 36.3 - 39.2 psi (250 - 270 kPa) as measured 38.0 psi (262 kPa)

CHASSIS: Type four wheel drive with duals **Serial No.** *ZEF301131* **Tread width** rear 83.4" (2118 mm) to 160.2" (4070 mm) front 83.4" (2118 mm) to 160.2" (4070 mm) **Wheelbase** 154.0" (3911 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 2.82 (4.54) second 3.40 (5.47) third 4.11 (6.61) fourth 4.95 (7.96) fifth 5.68 (9.14) sixth 6.24 (10.04) seventh 6.84 (11.01) eighth 7.52 (12.10) ninth 8.26 (13.30) tenth 9.08 (14.61) eleventh 9.95 (16.02) twelfth 10.94 (17.60) thirteenth 12.55 (20.21) fourteenth 15.12 (24.34) fifteenth 18.27 (29.40) sixteenth 22.00 (35.41) reverse 4.28 (6.88), 8.61 (13.85) **Clutch** multiple wet disc electrohydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated

DRAWBAR PERFORMANCE AT 2100 ENGINE RPM MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
327.74 (244.39)	48640 (216.36)	2.53 (4.07)	2151	11.5	1st Gear 0.474 (0.289)	14.80 (2.92)	0.047 (0.028)	200 (93)	63 (17)	28.90 (97.87)
394.81 (294.41)	48585 (216.11)	3.05 (4.90)	2138	10.9	2nd Gear 0.462 (0.281)	15.20 (2.99)	0.047 (0.028)	201 (94)	60 (15)	28.90 (97.87)
437.08 (325.93)	42845 (190.58)	3.83 (6.16)	2099	5.6	3rd Gear 0.428 (0.260)	16.40 (3.23)	0.047 (0.028)	201 (94)	66 (19)	28.90 (97.87)
438.93 (327.31)	35033 (155.83)	4.70 (7.56)	2100	3.7	4th Gear 0.426 (0.259)	16.50 (3.25)	0.045 (0.028)	200 (93)	72 (22)	28.85 (97.70)
441.44 (329.18)	30445 (135.43)	5.44 (8.75)	2100	2.9	5th Gear 0.423 (0.257)	16.59 (3.27)	0.046 (0.028)	200 (93)	69 (20)	28.86 (97.73)
443.42 (330.66)	27753 (123.45)	5.99 (9.64)	2100	2.7	6th Gear 0.423 (0.257)	16.62 (3.27)	0.045 (0.028)	201 (94)	69 (21)	28.85 (97.70)
439.98 (328.09)	25029 (111.33)	6.59 (10.61)	2101	2.4	7th Gear 0.426 (0.259)	16.49 (3.25)	0.046 (0.028)	201 (94)	66 (19)	28.86 (97.73)
441.58 (329.28)	22837 (101.58)	7.25 (11.67)	2100	2.2	8th Gear 0.423 (0.257)	16.61 (3.27)	0.045 (0.027)	199 (93)	72 (22)	28.84 (97.66)
440.47 (328.46)	20674 (91.96)	7.99 (12.86)	2099	1.9	9th Gear 0.425 (0.258)	16.54 (3.26)	0.045 (0.028)	201 (94)	73 (23)	28.85 (97.70)

Power take-off MY 2014 - 1000 rpm at 1998 engine rpm, MY 2015-1000 rpm at 1811 engine rpm **Unladen tractor mass** 49260 lb (22344 kg)

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the primary fuel filter was maintained at 110°F (43°C). The performance figures on this Summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2096**, Nebraska Summary 961, December 19, 2014.

Roger M. Hoy
Director

M.F. Kocher
J.D. Luck
P.J. Jasa
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB

dB(A)

At no load in 4th gear	74.7
Bystander in 16th gear	87.8

TIRES AND WEIGHT

Rear Tires -No., size, ply & psi (kPa)
Front Tires -No., size, ply & psi (kPa)
Height of Drawbar
Static Weight with operator -Rear
- Front
- Total

Tested Without Ballast

Four 800/70R38;***;8(55)
Four 800/70R38;***;12(85)
22.5 in (570 mm)
20250 lb (9185 kg)
29185 lb (13238 kg)
49435 lb (22423 kg)

DRAWBAR PERFORMANCE AT 1900 RPM **MAXIMUM POWER IN SELECTED GEARS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F Consumption lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st Gear										
329.12 (245.42)	48719 (216.71)	2.53 (4.07)	2151	11.3	0.475 (0.289)	14.79 (2.91)	0.047 (0.028)	201 (94)	62 (17)	28.90 (97.87)
2nd Gear										
395.53 (294.94)	48406 (215.32)	3.07 (4.93)	2139	10.5	0.460 (0.280)	15.25 (3.00)	0.046 (0.028)	200 (93)	60 (15)	28.90 (97.87)
3rd Gear										
449.50 (335.19)	46206 (205.53)	3.65 (5.87)	2038	7.3	0.425 (0.259)	16.52 (3.25)	0.047 (0.029)	201 (94)	65 (18)	28.90 (97.87)
4th Gear										
485.08 (361.72)	43080 (191.63)	4.23 (6.80)	1926	5.7	0.407 (0.248)	17.25 (3.40)	0.047 (0.028)	199 (93)	67 (20)	28.90 (97.87)
5th Gear										
493.76 (368.20)	38103 (169.49)	4.86 (7.82)	1900	4.2	0.401 (0.244)	17.49 (3.45)	0.047 (0.029)	203 (95)	69 (21)	28.86 (97.73)
6th Gear										
496.65 (370.35)	34687 (154.30)	5.37 (8.64)	1900	3.6	0.399 (0.243)	17.60 (3.47)	0.046 (0.029)	203 (95)	71 (22)	28.85 (97.70)
7th Gear										
495.12 (369.21)	31354 (139.47)	5.92 (9.53)	1900	3.0	0.400 (0.243)	17.55 (3.46)	0.047 (0.029)	203 (95)	67 (19)	28.86 (97.73)
8th Gear										
498.15 (371.47)	28666 (127.51)	6.52 (10.49)	1899	2.8	0.397 (0.242)	17.67 (3.48)	0.046 (0.028)	203 (95)	73 (23)	28.84 (97.66)
9th Gear										
496.22 (370.03)	25879 (115.11)	7.20 (11.58)	1901	2.6	0.400 (0.243)	17.55 (3.46)	0.046 (0.028)	204 (96)	73 (23)	28.84 (97.66)
10th Gear										
497.98 (371.34)	23590 (104.93)	7.92 (12.74)	1900	2.3	0.399 (0.242)	17.61 (3.47)	0.046 (0.028)	205 (96)	73 (23)	28.83 (97.63)

HYDRAULIC PERFORMANCE

CATEGORY: IVN

Quick Attach: yes

OECD Static test

Maximum force exerted through whole range: 19620 lbs (87.3 kN)

Three outlet sets combined

	Standard pump	High flow pump
i) Sustained pressure of the open relief valve:	2877 psi (198 bar)	3087 psi (213 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	59.1 GPM (223.6 l/min)
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	56.1 GPM (212.4 l/min)
Delivery pressure:	2526 psi (174 bar)	2710 psi (187 bar)
Power:	63.7 HP (47.5 kW)	88.7 Hp (66.2 kW)

Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM (162.2 l/min)	43.5 GPM (164.8 l/min)
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM (161.6 l/min)	40.5 GPM (153.5 l/min)
Delivery pressure:	2024 psi (139 bar)	2330 psi (161 bar)
Power:	50.4 HP (37.6 kW)	55.1 Hp (41.1 kW)

TwinFlow system

Two outlet sets combined

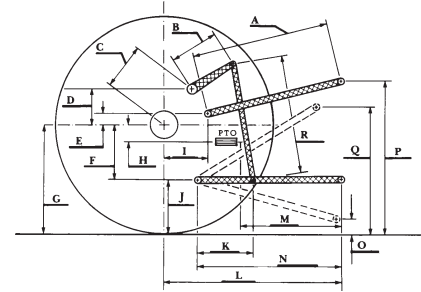
	Standard pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2877 psi (198 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM (165.8 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	101.1 GPM (382.8 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM (163.7 l/min)	56.4 GPM (213.6 l/min)
Delivery pressure:	2526 psi (174 bar)	2479 psi (171 bar)
Power:	63.7 HP (47.5 kW)	81.6 Hp (60.9 kW)

Two outlet sets combined

	High flow pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2993 psi (206 bar)	2855 psi (197 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.0 GPM (230.9 l/min)	57.3 GPM (217.0 l/min)
Combined flow:	118.3 GPM (447.9 l/min)	
iii) Pump delivery rate at maximum hydraulic power:	56.7 GPM (214.7 l/min)	56.4 GPM (213.6 l/min)
Delivery pressure:	2517 psi (174 bar)	2479 psi (171 bar)
Power:	83.3 HP (62.1 kW)	81.6 Hp (60.9 kW)

HITCH DIMENSIONS AS TESTED - NO LOAD

	inch	mm
A	32.6	827
B	29.9	760
C	23.2	590
D	22.0	558
E	13.5	342
F	13.4	340
G	38.2	970
H	6.4	162
I	22.8	578
J	24.8	630
K	29.0	736
L	56.3	1431
*L'	63.6	1615
M	34.3	871
N	46.5	1181
O	7.9	200
P	48.6	1234
Q	42.2	1072
R	39.8	1010



CASE IH STEIGER 540 Diesel

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln